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**Client: Slocan Lake Stewardship Society**

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September 19, 2012

We have tested the samples of water submitted by you August 07, 17, 22, 28 September 05, and report as follows:

**Method of Testing:**

Five samples were collected at seven sites over 30 days in accordance with Provincial Health Guidelines for evaluation of Total, Thermotolerant Coliforms and E.coli bacteria. Analyses was performed in accordance with methods outlined in the "Standard Methods of Examination of Water and Wastewater", 17th edition, 1989 published by the American Public Health Association, Specifically, Section 9222D. All tests were done by Membrane Filtration

**Results of Testing:**

|  | 8/07/2012 |       |        | 8/17/2012 |       |        | 8/22/2012 |       |        | 8/28/2012 |       |        | 9/05/2012 |       |        |
|--|-----------|-------|--------|-----------|-------|--------|-----------|-------|--------|-----------|-------|--------|-----------|-------|--------|
| All results expressed as Total Fecal E.coli Coliforms - "colony forming units" per 100ml | Total     | Fecal | E.coli | Total     | Fecal | E.coli | Total     | Fecal | E.coli | Total     | Fecal | E.coli | Total     | Fecal | E.coli |
| 1. Slocan  | 3         | 0     | 0      | 0         | 0     | 0      | 5         | 0     | 0      | 6         | 0     | 0      | 4         | 0     | 0      |
| 2. Silverton Hotel   | 11        | 3     | 2      | 24        | 2     | 0      | 33        | 0     | 0      | 5         | 1     | 1      | 13        | 0     | 0      |
| 3. Near Silverton Creek  | 14        | 1     | 4      | 2         | 1     | 0      | 1         | 0     | 1      | 19        | 0     | 0      | 10        | 0     | 0      |
| 4. New Denver Hospital   | 7         | 0     | 0      | 23        | 1     | 0      | 6         | 0     | 0      | 2         | 0     | 0      | 6         | 0     | 0      |
| 5. New Denver, Carpenter Creek   | 2         | 0     | 0      | 6         | 2     | 0      | 9         | 0     | 0      | 2         | 0     | 0      | 0         | 0     | 0      |
| 6. Roseberry Wilson Creek  | 0         | 0     | 0      | 0         | 0     | 0      | 12        | 0     | 0      | 0         | 0     | 0      | 6         | 0     | 0      |
| 7. Hills   | 0         | 0     | 0      | 17        | 1     | 0      | 116       | 0     | 1      | 18        | 0     | 1      | 21        | 0     | 0      |
| 8. QA/QC (in house)  |           |       |        | 0         | 0     | 0      | 0         | 0     | 0      | 0         | 0     | 0      | 0         | 0     | 0      |

Cfu = colony forming units, Gt = Greater than

Analyst:  
Tony Yeow, Passmore Laboratory Ltd.

## Water Temperature in Degrees Centigrade at Time of Collection

| Date                              | 8/7/2012 | 8/17/2012 | 8/22/2012 | 8/28/2012 | 9/5/2012 |
|-----------------------------------|----------|-----------|-----------|-----------|----------|
| 1. Slocan                         |          | 18        | 18        | 15.5      | 16       |
| 2. Silverton Hotel                |          | 21        | 18        | 19        | 17       |
| 3. Near Silverton<br>Creek        |          | 20        | 19        | 18        | 17       |
| 4. New Denver<br>Hospital         | 22       | 20.5      | 19.5      | 19        | 17       |
| 5. New Denver,<br>Carpenter Creek |          | 20        | 19        | 17        | 15       |
| 6. Roseberry<br>Wilson Creek      |          | 18        | 18        | 18        | 16       |
| 7. Hills                          |          | 16.5      | 17        | 17        | 14       |

**Background:**

Coliforms refer to a group of bacteria that have been tested for over 90 years as indicators of human infection. They are defined as rod-shaped non-spore forming bacteria that ferment lactose with gas production. They are often associated with decaying plant material. A sub-group of this class are the Fecal or Thermotolerant coliforms. They are abundant in the feces of warm-blooded animals, but can also be found in the aquatic environment, in soil and on vegetation. Their presence is used to indicate other pathogenic organisms of fecal origin that may be present. These include other bacteria, viruses, protozoa (*Giardia*, *Cryptosporidium*) and multicellular parasites. *E.coli* is a sub-group of the Coliforms organisms known to be associated with human infection. Thermotolerant coliform bacteria do not tolerate cold water and their presence indicates recent contamination. The three tests done are described:

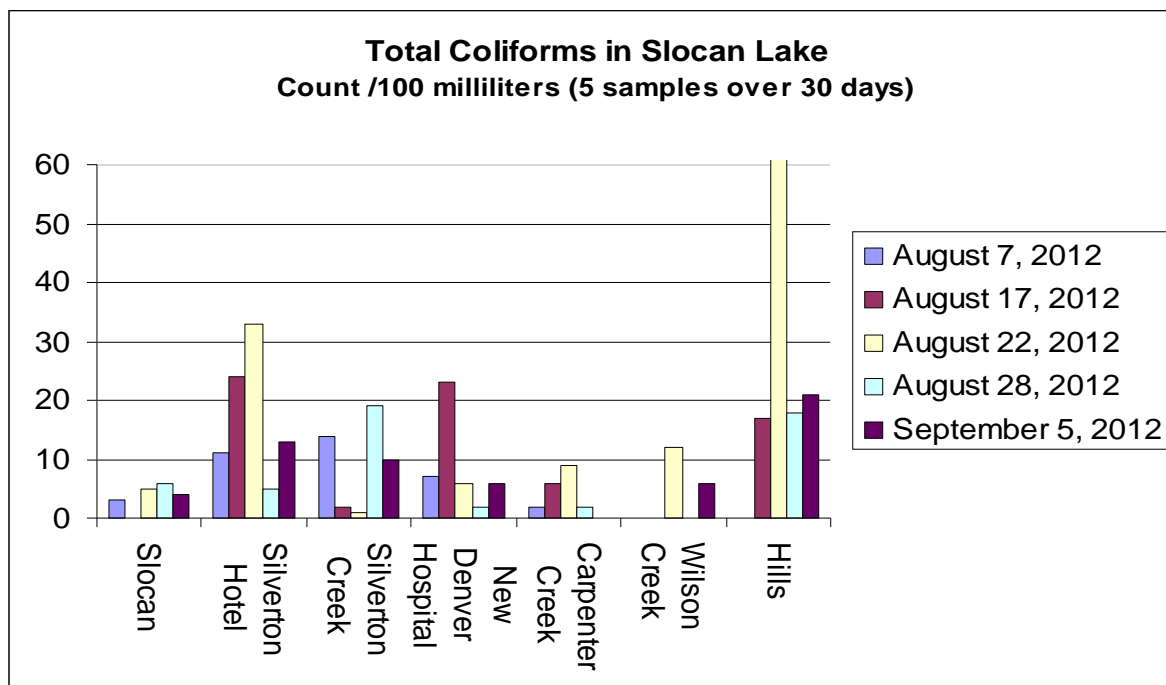
1. Total Coliforms – Bacteria that ferment lactose at 35°C. This group includes bacteria from warm-blooded animal source as well as plant source. E.g. from algae, decaying plants
2. Thermotolerant or Fecal Coliforms – Bacteria that have the capacity to grow at elevated temperature e.g. recently shed from the intestine of warm blooded animals
3. *E.coli* – Bacteria that are a subgroup of the Total and Thermotolerant groups that are known to inhabit humans, warm blooded animals and some serotypes are pathogenic to humans.

Provincial Government Guidelines for “raw” or untreated *drinking water* state that no Thermotolerant (Fecal Coliforms) and no *E.coli*. should be present. Guidelines for water used for *primary contact recreation* use state the Thermotolerant Coliform level should not exceed a geometric mean of 200/100ml in 5 samples taken in a 30 day period. Also, the *E.coli* level should not exceed a geometric mean of 77/100ml in 5 samples over a 30 day period.

**Findings:**

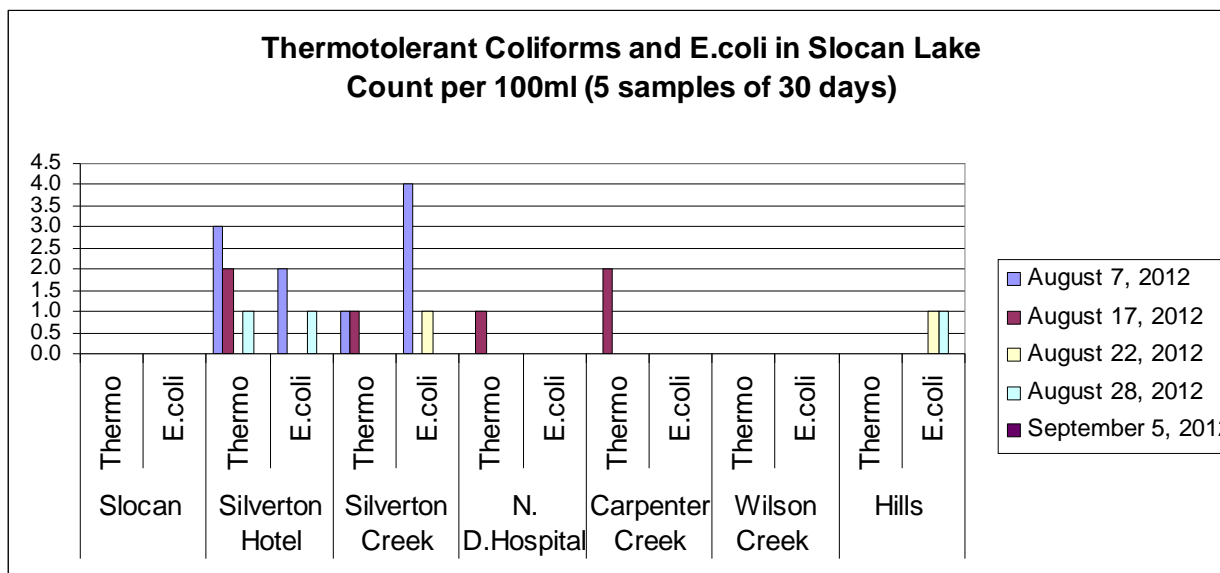
**Total Coliforms**

The test results for 2012 showed relatively high counts at Hills (116/100ml on Aug 22<sup>nd</sup>) and near the Silverton Hotel (33/100ml on Aug 22<sup>nd</sup>) Historically, Hills and Slocan have shown higher total coliform counts. Overall, the counts are in-line with those seen in 2010 and 2011



**Thermotolerant Coliform and E.coli Bacteria**

In 2012, samples collected near the Silverton Hotel and Silverton Creek showed both Thermotolerant Coliforms and E.coli. No Thermotolerant Coliforms or E.coli were seen in Slocan or near Wilson Creek. This differs from collections in 2010 where E.coli was seen at Slocan Station and no E.coli was seen at any station in 2011. Overall, counts were low (less than 4/100ml) and in the same range as previous years.



Summary:

In years 2010 and 2011 we tended to see elevated Coliform counts at stations in Slocan and Hills, while in 2012, slightly higher counts were observed near Silverton and again in Hills. No exceptionally high counts for Thermotolerant coliforms or E.coli were observed at any station.

It is important to continue recording water temperature when collecting samples because pathogenic bacteria are sensitive to water temperature.

Respectfully Submitted,

Jennifer and Tony Yeow  
Passmore Laboratory Ltd.

*Passmore Laboratory Ltd. complies with methods and certification through UBC's Canadian Microbiological Proficiency Testing Program*